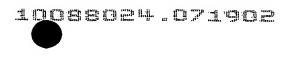DaimlerChrysler AG   FTP/E Dr.EW/fr
    Stuttgart

                    Patent Claims

5   1.   Method for monitoring the traffic state in a
    traffic network with one or more effective bottlenecks,
    in particular in a road traffic network, in the case of
    which
    -    the traffic state is classified, taking account of
10 recorded traffic measured data for one or more traffic
    parameters which comprise at least information on the
    traffic intensity and/or the average vehicle speed,
    into in each case one of a plurality of state phases
    which comprise at least the state phases of "free
15 traffic" and "synchronized traffic",
         characterized in that
    -    the traffic state upstream of a respective
    effective bottleneck of the traffic network is
    classified, when an edge ($F_{s,}$ $_F$) fixed thereat is
20 detected between downstream free traffic (B_F) and
    upstream synchronized traffic (B_S), as a pattern,
    representative of the respective effective bottleneck,
    of dense traffic which includes one or more different
    regions (B_S, B_{GS}, B_{St}) which are consecutive upstream, of
25 different state phase composition, and an associated
    profile of the traffic parameters taken into account
    for the state phase determination.

    2.   Method according to Claim 1, further characterized
30 in that the traffic state is classified, when an
    individual pattern, arising initially at an associated,
    effective bottleneck, of dense traffic reaches one or
    more effective bottlenecks following upstream, in this
    route section as an overarching pattern, representative
35 of the included effective bottlenecks, of dense traffic
    which, like a respective individual pattern, includes

one or more different regions, which are consecutive upstream, of different state phase composition, and an associated profile of the traffic parameters taken into account for the state phase determination.

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3. Method according to Claim 1 or 2, further characterized in that the respective pattern, belonging to one effective bottleneck or common, as overarching pattern, to a plurality of effective bottlenecks, of
10 dense traffic with its time-dependent and location-dependent traffic parameter profile is empirically determined from recorded traffic measured data and stored in a fashion which can be called up.

15 4. Method according to one of Claims 1 to 3, further characterized in that it is established for the respective bottleneck as a function of vehicle influx whether the pattern comprises only a region (B_S) of synchronized traffic or comprises this and a pinch
20 region (B_{GS}), adjoining upstream, or comprises these two regions and a region (B_{St}), adjoining upstream, of moving widespread congestion, the associated edge positions between the respective different state phases are determined, and each of the three pattern variants
25 is assigned a corresponding time-dependent and location-dependent profile of the average vehicle speed and/or the traffic flow and/or the traffic density.

5. The method according to one of Claims 2 to 4,
30 further characterized in that it is established for the traffic network as a function of the vehicle flows where and in what temporal sequence overarching patterns arise, in what temporal and spatial sequence the regions of "synchronized traffic", "pinch region"
35 and "moving widespread congestion" arise and develop in each of the overarching patterns, and whether overlaps of such regions take place, and for a respective overlap the temporal and spatial characteristic of

congestion points through regions of synchronized traffic and/or congested synchronized traffic is predicted.

5   6.   Method according to Claim 4 or 5, further characterized in that the temporal evolution of the edge positions ($F_{F,s}$, $F_{GS,s}$, $F_{F,GS}$, $F_{St,GS}$) of the various regions of the respective pattern of dense traffic, and/or the edge positions of congestion points inside 10   various overarching patterns, and/or the occurrence of a respective new overarching pattern is currently estimated and predicted for future points in time.

7.   Method according to one of Claims 4 to 6, further 15   characterized in that the associated travel time to be expected is additionally currently estimated and/or predicted for future points in time for the respective individual or overarching pattern of dense traffic.

20   8.   Method according to one of Claims 4 to 7, further characterized in that the current vehicle influx is detected for the respective individual or overarching pattern of dense traffic, and the current positions of the edges between the various pattern regions are 25   determined, and these current input data are used to select the best-fitting pattern profile from the stored pattern profiles and to use it as a basis for predicting the future traffic state in the relevant route region.